What is claimed is:

1. A method of reducing spatial noise in an image having a plurality of pixels, the pixels being arranged in a plurality of (h) rows and (w) columns, comprising:

providing a set of three 64 bit registers, each register representing eight horizontally adjacent pixel values from one of three respective vertically adjacent image rows;

computing eight sets of directional high-pass values, one for each horizontal pixel position represented by said registers; and

computing directionally smoothed low pass pixel values by combining said high-pass values with image pixel values to produce directionally weighted sums.

2. A method according to claim 1, wherein:

said three 64-bit registers include a first (up) register, a second (mid) register and a third (down) register, said first, second and third registers each representing pixel values for eight horizontally adjacent image pixels;

pixel values in said first (up) register represent image pixels horizontally aligned with and vertically adjacent to pixels represented by corresponding pixel values in said second (mid) register; and

pixel values in said second (mid) register represent image pixels horizontally aligned with and vertically adjacent to pixels represented by corresponding pixel values in said third (down) register.

3. A method according to claim 2, wherein:

said step of computing eight sets of directional high-pass values further comprises:

computing eight average values for corresponding first and third image row pixels in said first (up) and third (down) registers;

computing eight maxima and eight minima between said average values and corresponding second image row pixels in said second (mid) register;

determining eight high-pass absolute values by subtracting said minima from said maxima;

setting values of eight sign bytes such that if corresponding second row pixel values and minima are equal, a corresponding sign byte is set to all 1's, otherwise the corresponding sign byte is set to all 0's;

shifting the first (up) and third (down) registers for left diagonal alignment of pixel values;

calculating left diagonal high-pass absolute values and signs;

shifting the first (up) and third (down) registers for right diagonal alignment of pixel values;

calculating right diagonal high-pass absolute values and signs;

shifting said second (mid) register for horizontal alignment of pixel values; and

calculating horizontal high-pass absolute values and signs.

4. A method according to claim 2, wherein:

said step of computing directionally smoothed low pass pixel values further comprises:

clearing (zeroing) high-pass values to exclude from low pass filters;

clearing (zeroing) sign bytes for high pass values equal to zero;

computing low pass values for four upper bytes by summing four corresponding high-pass values and subtracting from four corresponding second image row pixel values in said second (mid) register; and

computing low pass values for four lower bytes by summing four corresponding high-pass values and subtracting from four corresponding second image row pixel values in said second (mid) register.

5. A method according to claim 2, wherein:

the first (up) register represents pixels p(i-l, j+k) in a corresponding first (up) image row;

the second (mid) register represents pixels p(i, j+k) in a corresponding second (mid) image row; and

the third (down) register represents pixels p(i+1, j+k) in a corresponding third (down) image row.

6. A method according to claim 5, further comprising:

storing directional smoothing results for pixels p(i, j+k) in place of p(i-1, j+k).

7. A method according to claim 5, further comprising:

computing scaled high-pass filters ($hp\_(i,j+k,d)$) for an aligned vertical direction (d=l) for eight horizontally contiguous pixels simultaneously using the relationship:

$$hp\_filt(i, j +,k,d) = p(i, j + k) -(p(i -l, j +k) + p(i + 1, j + k))/2 \qquad k = [0,7].$$

8. A method, according to claim 5, further comprising:

calculating low-pass filter values ($lp\_MMX(i,j+k)$) in accordance with the relationship:

$$lp\_MMX(i, j + k) = \left[4 \cdot p(i, j + k) - \sum_{d-1}^{D} hp\_filt(i, j + k, d) \right] >> 2 \qquad k = [0,7].$$

9. A method according to claim 5, further comprising:

determining a degree of directional smoothing for each pixel according to a number of directional high-pass values ($hp\_filt(i,j+k,d)$) that have high-pass absolute values less than or equal to | $hp_{min}(i, j + k)$ +Δ |.

10. A method of reducing spatial noise in an image having a plurality of pixels, the pixels being arranged in a plurality of (h) rows and (w) columns, comprising:

providing a set of 64 bit registers for representing eight 8-bit pixel values, said registers including a first (up) register for representing eight horizontally adjacent pixel values from a first image row; a second (mid) register for representing eight horizontally adjacent pixel values from a second image row, said second image row pixels occurring vertically adjacent to and horizontally aligned with said first row pixels; and a third (down) register for representing eight horizontally adjacent pixel values from a third image row, said third image row pixels occurring vertically adjacent to and horizontally aligned with said second image row pixels;

loading said first (up), second (mid) and third (down) registers with pixel values from three vertically adjacent image row and saving previous register contents;

computing eight average values for corresponding first and third image row pixels in said first (up) and third (down) registers;

computing eight maxima and eight minima between said average values and corresponding second image row pixels in said second (mid) register;

determining eight high-pass absolute values by subtracting said minima from said maxima;

setting values of eight sign bytes such that if corresponding second row pixel values and minima are equal, a corresponding sign byte is set to all 1's, otherwise the corresponding sign byte is set to all 0's;

shifting the first (up) and third (down) registers for left diagonal alignment of pixel values;

calculating left diagonal high-pass absolute values and signs;

shifting the first (up) and third (down) registers for right diagonal alignment of pixel values;

calculating right diagonal high-pass absolute values and signs;

shifting said second (mid) register for horizontal alignment of pixel values;

calculating horizontal high-pass absolute values and signs;

clearing (zeroing) high-pass values to exclude from low pass filters;

clearing (zeroing) sign bytes for high pass values equal to zero;

computing low pass values for four upper bytes by summing four corresponding high-pass values and subtracting from four corresponding second image row pixel values in said second (mid) register;

computing low pass values for four lower bytes by summing four corresponding high-pass values and subtracting from four corresponding second image row pixel values in said second (mid) register; and

packing and storing said low pass values into said first register.

11. A method of reducing spatial noise in an image having a plurality of pixels, the pixels being arranged in a plurality of (h) rows and (w) columns, comprising:

calculating a plurality of high-pass filter values for a number of pixels based upon surrounding pixel values in a 5x5 pixel area surrounding each pixel for which a high-pass filter value is to be calculated;

determining directionality information for each from the high-pass filter values for each pixel;

determining directional low-pass (smoothing) filter values for each pixel based upon the directionality information for each pixel; and

applying the low-pass filter values (smoothing) to each pixel according to pixel values in the 5x5 pixel area surrounding each pixel.

12. A method according to claim 11, wherein each high-pass filter calculation comprises a summation of products, each product being determined by multiplying each pixel value in a 5x5 pixel area surrounding each pixel by a corresponding high-pass filter coefficients.

13. A method according to claim 12, wherein directionality is determined by identifying a high-pass filter value with a highest absolute value above a threshold value.

14. A method according to claim 13, wherein the threshold value is determined by adding a constant to the value of the high-pass filter having a minimum absolute value.

15. A method according to claim 11, wherein the directional low pass filter values are determined to decrease the relative amount of smoothing applied in a direction indicated by the directionality information.

16. A method according to claim 11, wherein the number of low pass (smoothing) filters for each pixel value is equal to the number of corresponding high pass filters.

17. A method according to claim 16, wherein the number of high pass filters for each pixel value is four.

18. A method according to claim 17, wherein the filter directions are horizontal, vertical, diagonal right and diagonal left.

19. A method according to claim 16, wherein the number of high pass filters for each pixel value is eight.

20. A method according to claim 19, wherein the filter directions are, horizontal, vertical, diagonal right, diagonal left, greater diagonal right, greater diagonal left, lesser diagonal right and lesser diagonal left.